I claim:

1. (currently amended) A method for forming **a** microelectromechanical sensor~~s, (MEMS)~~, wherein ~~the~~ **at least one** sensor~~s~~ and ~~the~~ sensor signal processing electronics are monolithically integrated, comprising **the steps of**

(i) firmly ~~connecting~~ **bonding** a first silicon wafer having **at least one cavity** ~~cavities~~ formed thereon ~~with~~ **to** a second **wafer as a** cap wafer having an epitaxial layer ~~by means of~~ **, through** high temperature fusion bonding via the epitaxial layer, **to form a wafer composite;**

(ii) wherein the wafer composite is reduced from the second wafer towards the epitaxial layer, ~~that is,~~ **down** to a membrane thickness corresponding to ~~the~~ **a** micromechanical portion of the sensor ~~or to~~ **with** a thickness of ~~another~~ **a device** ~~portion of the semiconductor wafer~~ responding to mechanical stress, and wherein ~~in a further step~~ the wafer composite is finally polished **to provide a polished surface;** ~~[,]~~

(iii) wherein after the polishing ~~process, the~~ **step,** electronic sensor structures **associated to** ~~registered to~~ the cavity are commonly ~~formed~~ **manufactured** along with ~~the~~ **one of** analog~~eus or/~~ and digital circuitries on the polished surface by ~~means of~~ **a** CMOS technology method~~.~~.

2. (currently amended) The method of claim 1, ~~characterized in that~~ **wherein** prior to the wafer bonding ~~process~~ **step**, structures of electronic circuitries are already on ~~that~~ **a** side of the epitaxial layer that faces the cavity after the bonding ~~process~~ **step**.

3. (currently amended) The method of 1, ~~characterized in that~~ **wherein** the electronic structures formed on the side facing the cavity at least after the wafer bonding ~~process~~ **step** extend to the polished **surface** ~~side~~ to form ~~, for instance,~~ electronically conductive channels.

4. (currently amended) The method of claim 1, wherein the electronic structures created at the side facing the cavity comprise**s a** specific sensor~~s~~ ~~in particular~~ for ~~the~~ analysis of ~~the~~ **a** medium located adjacent to the membrane in the cavity.

5. (currently amended) A method for forming a ~~microelectromecanical~~ **microelectromechanical** sensor or system (MEMS), wherein at least one sensor and an associated sensor processing electronic **circuit element** are monolithically integrally formed,

(i) by bonding a first wafer comprising at least one cavity with a second wafer carrying an epitaxial layer by means of a high temperature fusion bonding process via the epitaxial layer to form a composite of the wafers;

(ii) wherein the composite of the wafers is thinned from the second wafer down to the epitaxial layer and is finally polished, to form a polished surface;

(iii) wherein after the polishing process at least one sensor structure aligned to the cavity and at least one **or more of an** analog~~eus or~~ and digital circuit on the polished surface are formed by ~~means of~~ **a** CMOS technology method **at least partially in the thinned epitaxial layer**.

6. (currently amended) The method of claim 5, wherein thinning is performed according to a membrane thickness corresponding to ~~the~~ **a** micromechanical portion of the sensor or according to a thickness of ~~another portion of the semiconductor wafer~~ **a portion** that is sensitive or responsive to a mechanical stress.

7. (currently amended) The method of claim 5, wherein prior to the wafer bonding **step** ~~process~~ electronic circuits are already formed on or aligned to the side which after the bonding **step** of the wafers faces the cavity or covers the cavity.

8. (currently amended) The method of claim 5, wherein ~~the~~ **an** electronic **sensor** structure~~s~~ **is** formed on ~~the~~ **a** side facing the cavity **and** extend**s**, at least after the wafer bonding **step** ~~process,~~ to the polished **surface** ~~side and on particular form electrically conductive channels~~.

9. (currently amended) The method of claim 5, wherein the ~~electronic~~ **sensor** structures located at ~~the~~ **a** side facing the cavity comprise sensors for ~~the~~ analysis of a medium located ~~adjacent to the membrane~~ in the cavity.

10. (currently amended) A micromechanical sensor ~~or~~ system (MEMS), wherein at least one sensor and associated sensor signal processing electronics are monolithically integrally formed, **comprising**

(i) ~~by bonding~~ ~~the~~ **a** first wafer comprising at least one cavity **and bonded** to a second wafer carrying an epitaxial layer by ~~means of a~~ high temperature fusion bonding ~~process~~ via the epitaxial layer so as to form a composite of ~~the~~ wafers;

(ii) **wherein** ~~by reducing~~ the composite of ~~the~~ wafers **has a reduced thickness** from the second wafer down to the epitaxial layer and ~~by polishing the same~~ **a polished surface**;

(iii) wherein a mechanical sensor structure is aligned to the cavity and is commonly provided with **one of** an analog~~ous or/~~ and digital circuit on the polished surface at least partially in the thinned epitaxial layer, formed **at the polished surface by monolithic integration** ~~prior to or after the polishing process by means of a monolithic integrating technology method~~.

11. (currently amended) The sensor of claim 10, wherein the **reduced thickness has a** ~~thinning is performed to obtain the~~ thickness of a membrane.

12. (currently amended) The sensor of claim 10, wherein the circuit structure is ~~provided prior to or during~~ **encompassed in** the **fusion** bonding.

13. (currently amended) The sensor of claim 10, wherein the **monolithic integration** ~~technology method~~ is ~~a~~ CMOS ~~technique~~.

14. (new) The method of claim 1, wherein the associated electronic sensor structures are registered to the cavity and are commonly formed along with the at least one of analog and digital circuitries on the polished surface at least partially in the thinned epitaxial layer.

15. (new) The method of claim 8, wherein electronic sensor structures are formed on the side facing the cavity to comprise electrically conductive channels.

* * *